Chronic Liver Disease in the United States Disease Burden and Epidemiology

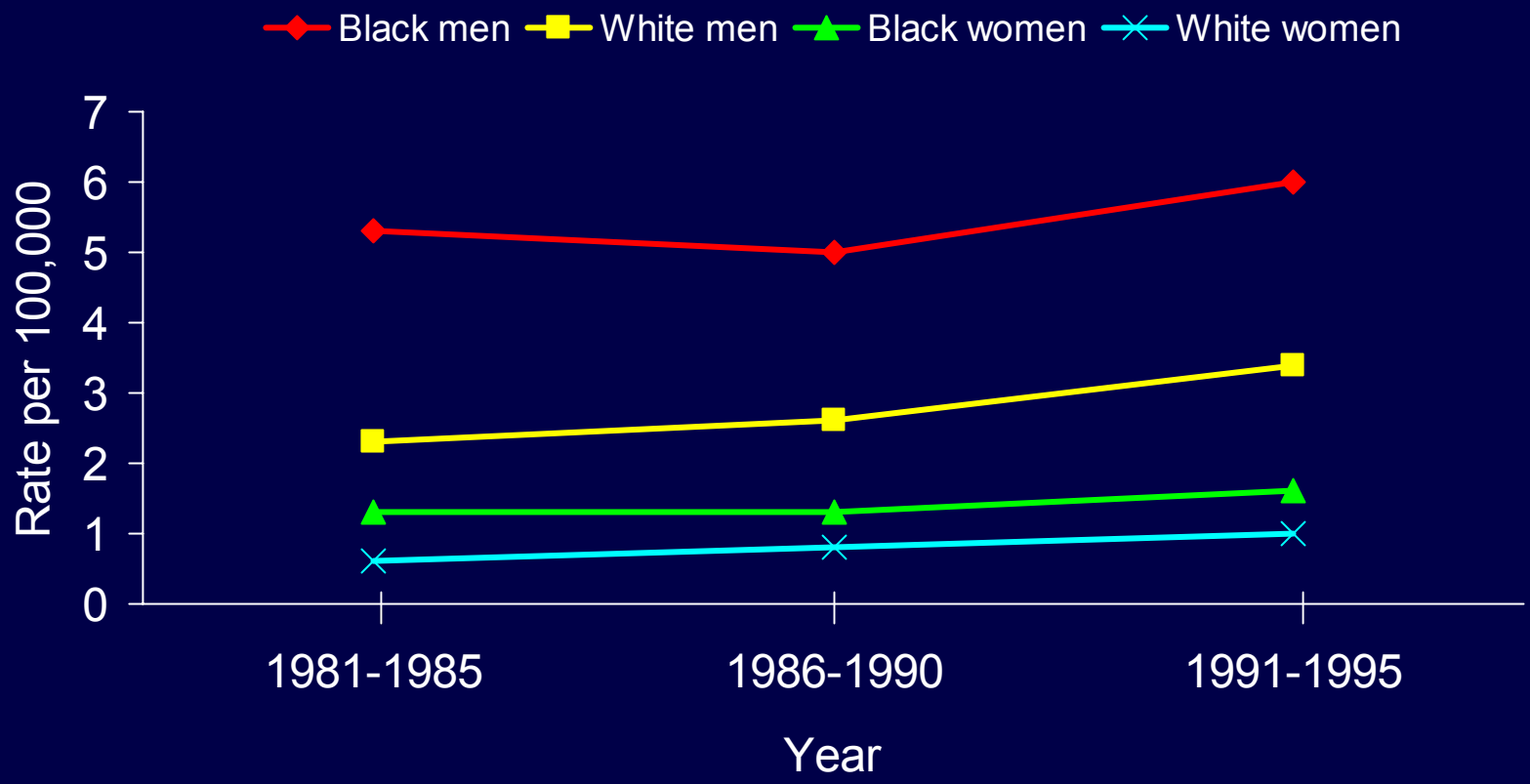
Beth P. Bell MD, MPH
Division of Viral Hepatitis
National Center for Infectious Diseases

CDC

Topics

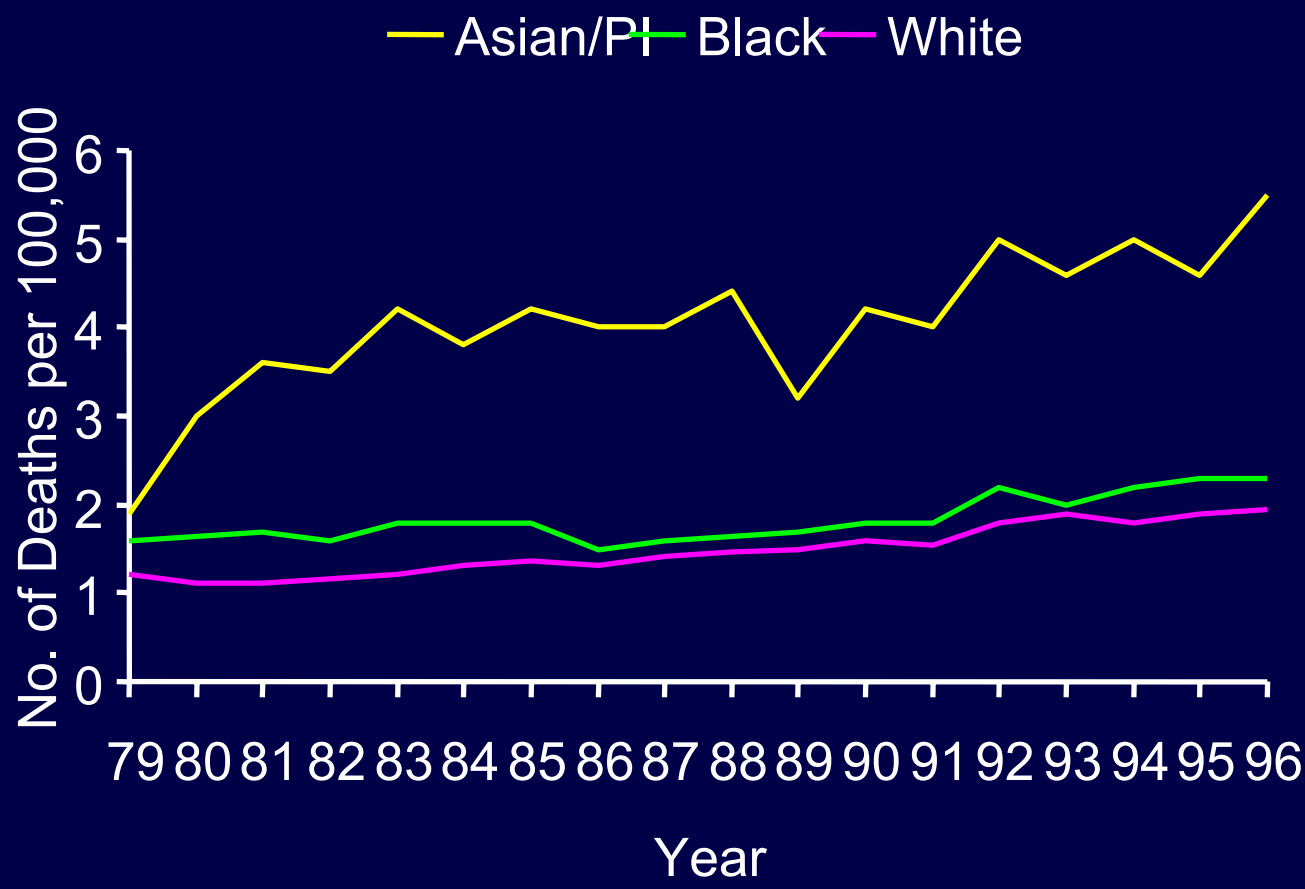
- Mortality
  - HCC
  - CLD
- CLD Morbidity
  - "Period prevalence"
  - Chronic liver disease surveillance study
  - Other surveillance methods
- Directions for the future

Age-adjusted HCC mortality rates among blacks and whites, by sex, 1981-1995

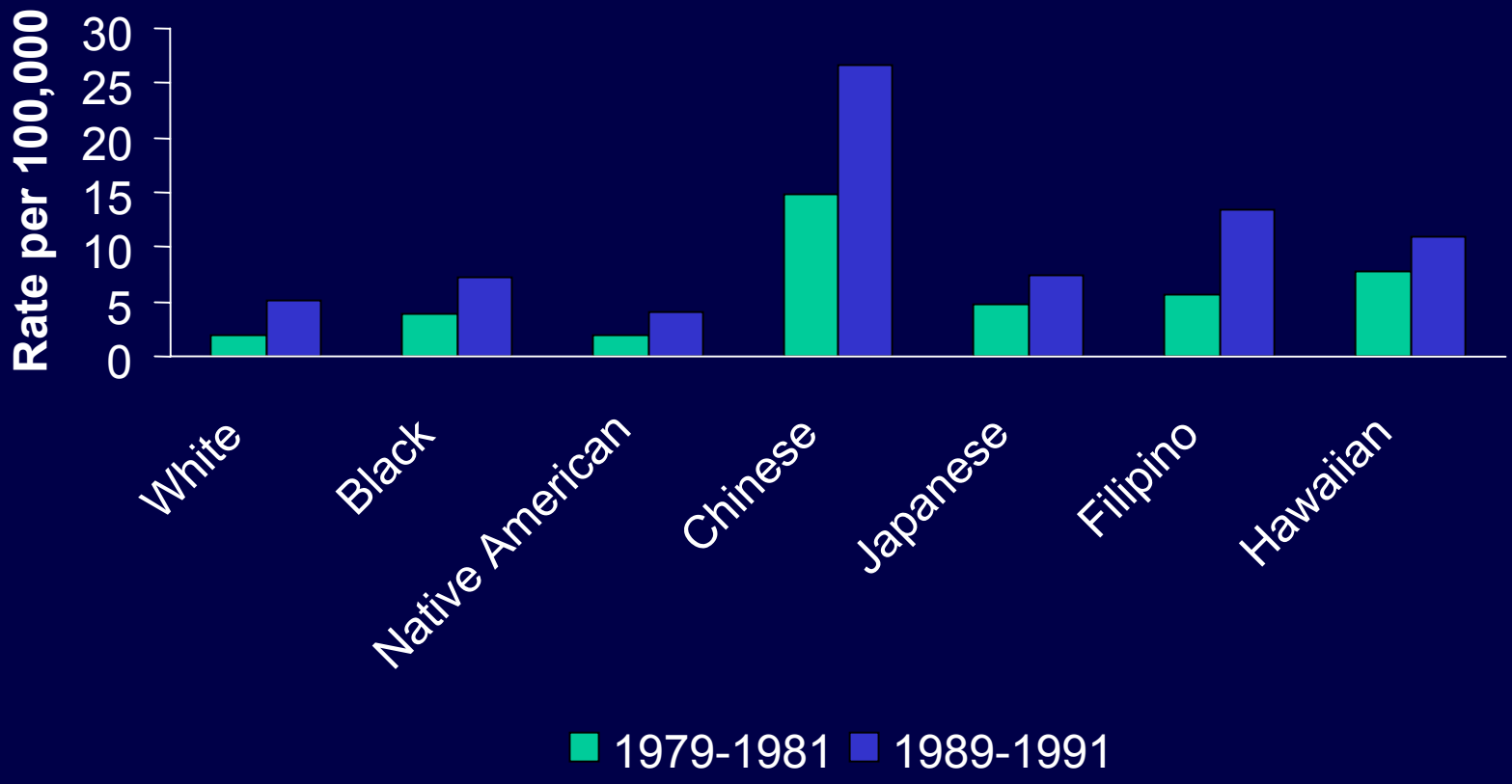


Source: El-Serag, HB et al, NEJM 1999.

HCC crude mortality rate by race
United States, 1979-1996



Age-adjusted HCC mortality rates among men, by race; 1979-1981 and 1989-1991



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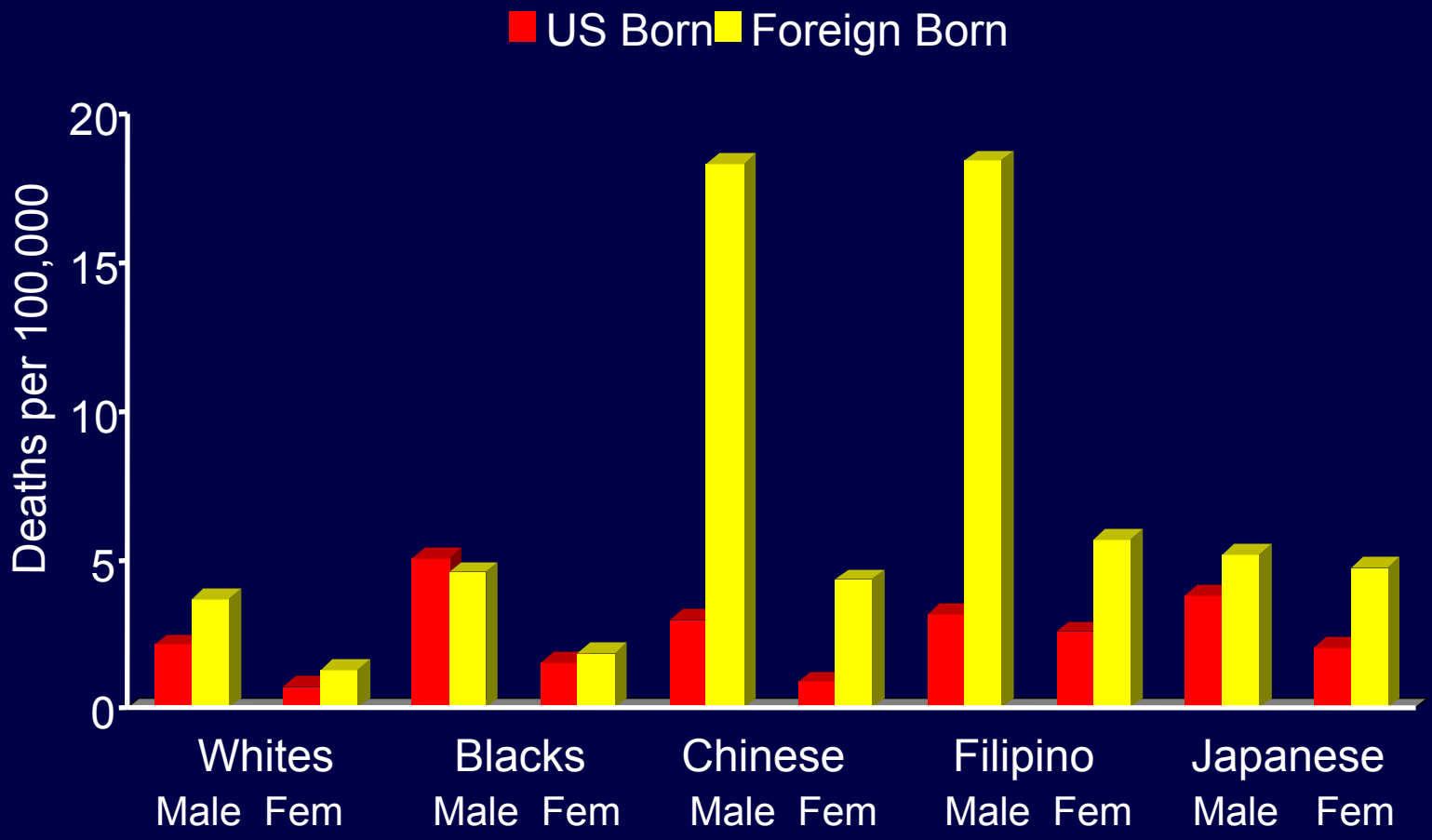
Age-adjusted HCC mortality by race, sex, and place of birth, U.S., 1989-1991



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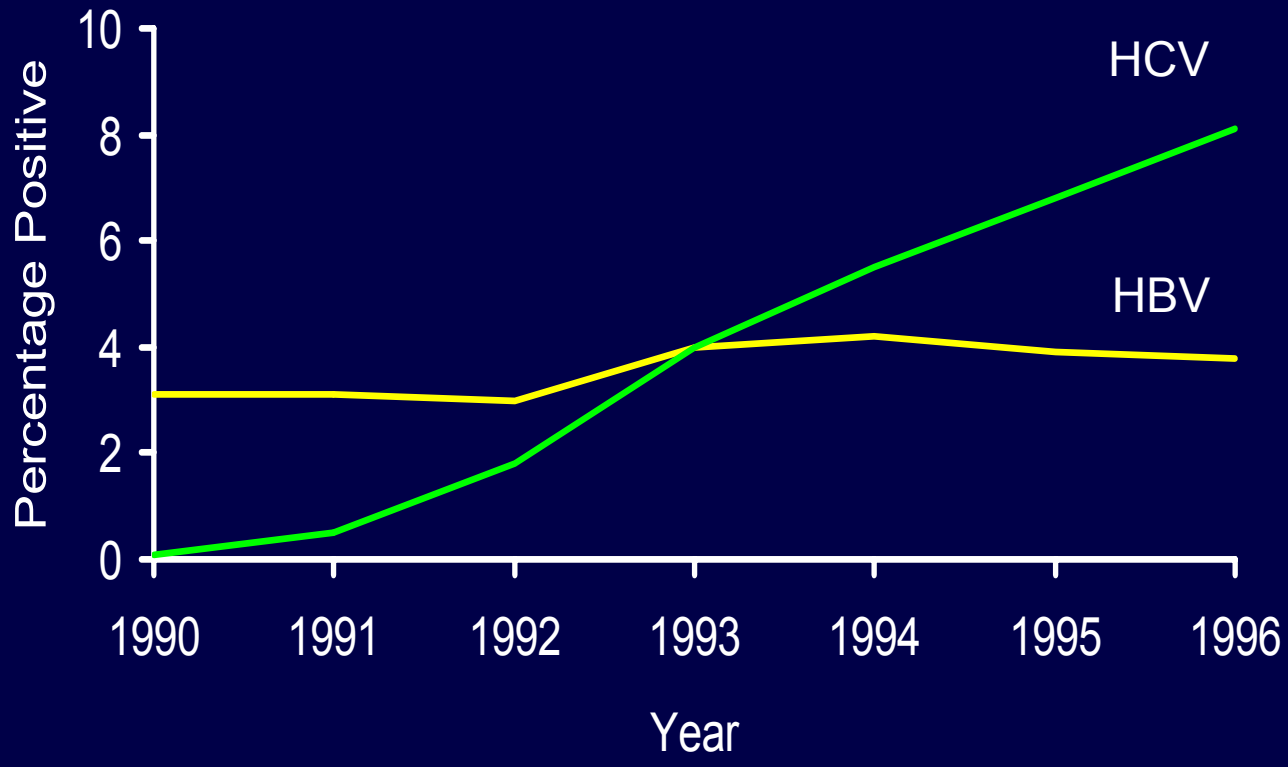
Proportion of HCC deaths coded for HBV or HCV infection, United States, 1990-1996



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Conclusions

- Higher HCC rates
  - Asians (10-fold)
  - Foreign born (1.5-6.5 fold)
  - Males (2-4 fold)
- Increase over past two decades in most groups
  - HBV and HCV each likely to account for some
  - Caution interpreting HCV trends

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Chronic Liver Disease Mortality 1990-1998

- Records with cause of death
  - Chronic liver disease and cirrhosis (571.0-571.9)
  - Viral hepatitis except hepatitis A (070.2-070.9)
  - Selected sequelae of CLD (572.2-572.4)
- Possible etiology
  - Underlying or contributing causes of death

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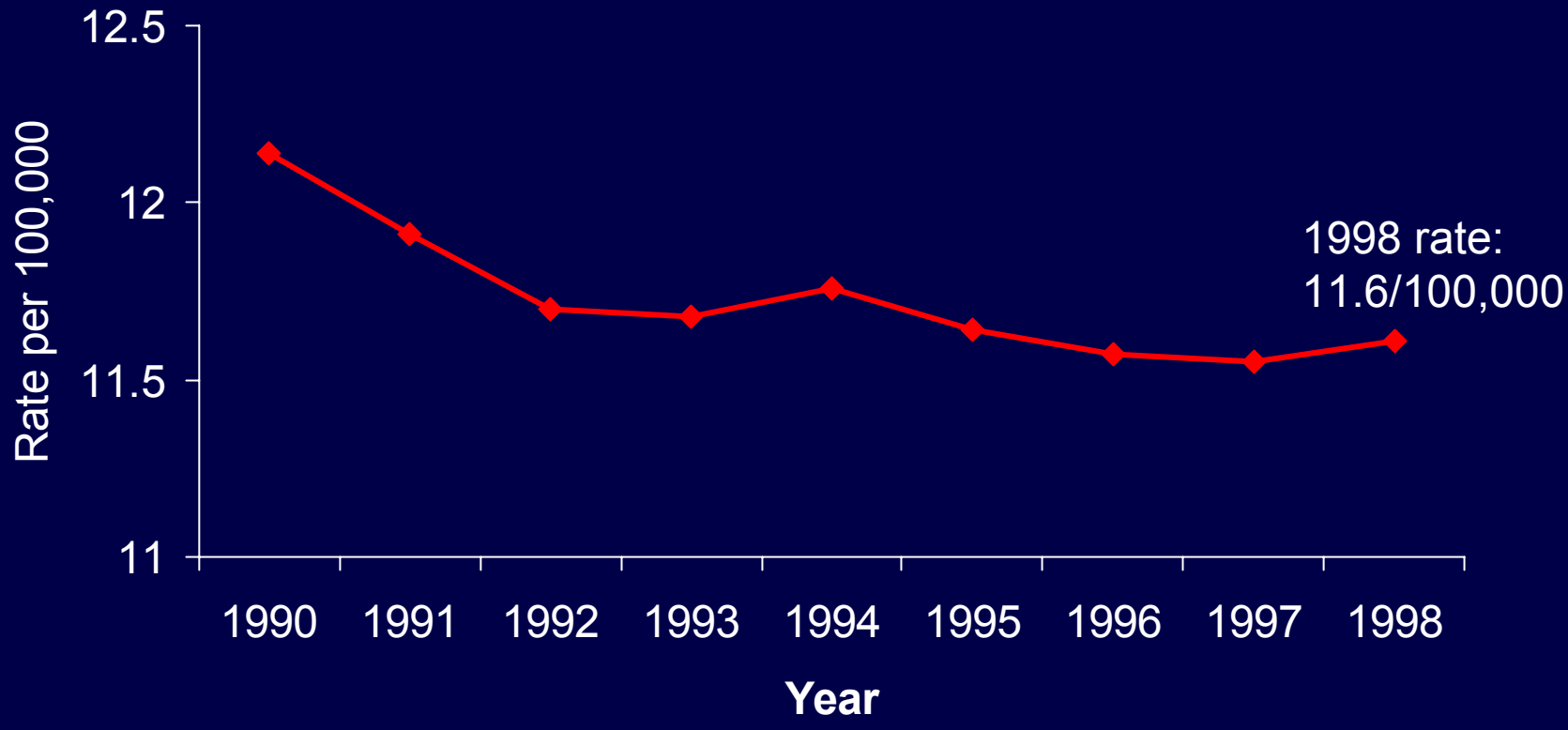
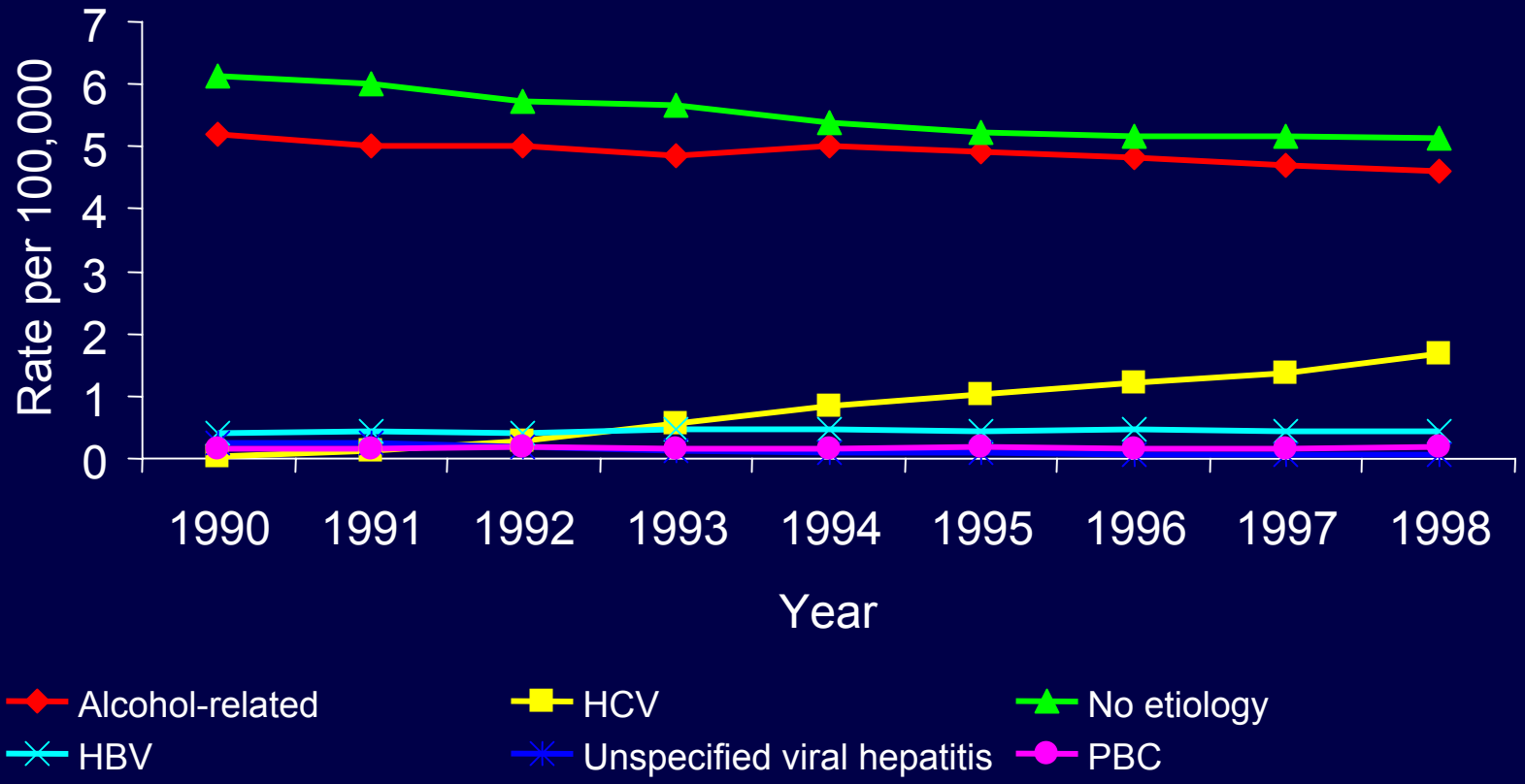
Age-adjusted CLD death rates by year, United States; 1990-1998



Source: Vong and Bell, Hepatology, in press.

Age-adjusted CLD death rates, by year and etiology; 1990-1998



Source: Vong and Bell, Hepatology, in press.

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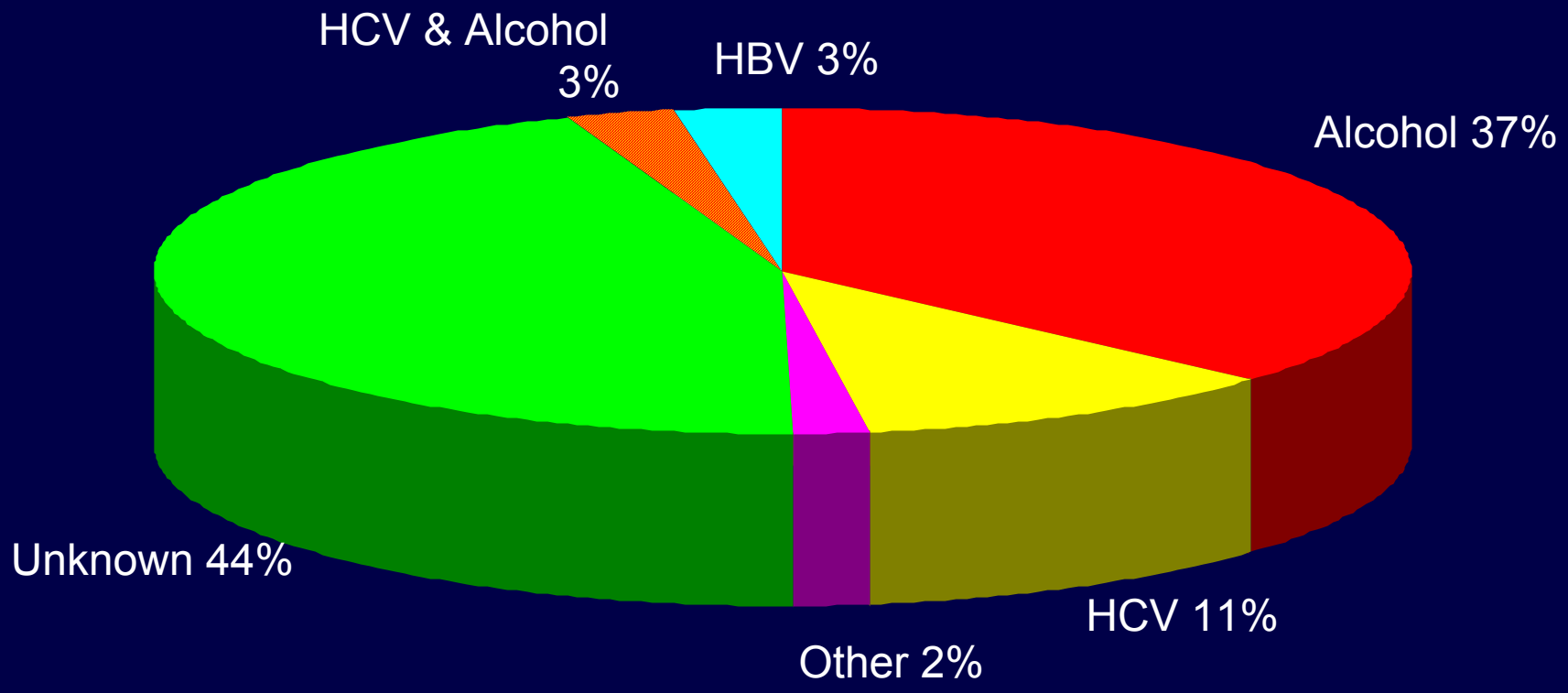
Etiology of chronic liver disease-related deaths, 1998; n=30,933



Source: Vong and Bell, Hepatology, in press.

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Death Certificate Validation Studies
Northern California Kaiser and New Haven County, CT; 2000

- Search NCHS Multiple-Cause Mortality Files using expanded list of ICD-10 codes
- Collect additional information on decedents to validate cause of death and determine underlying etiology
  - Chart review
  - Medical examiner reports
  - Questionnaire to certifier

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Comparison of CLD mortality rates using different methods

	Rate/100,000*		
Method	NCHS	KPNC	NHCLS
Standard (ICD 571)	9.6	8.4	14.0
Expanded codes	11.6		
Expanded codes and chart review		16.9	21.0

*Age-adjusted; NCHS 1998 rate; KPNC and NHLS 2000 rate

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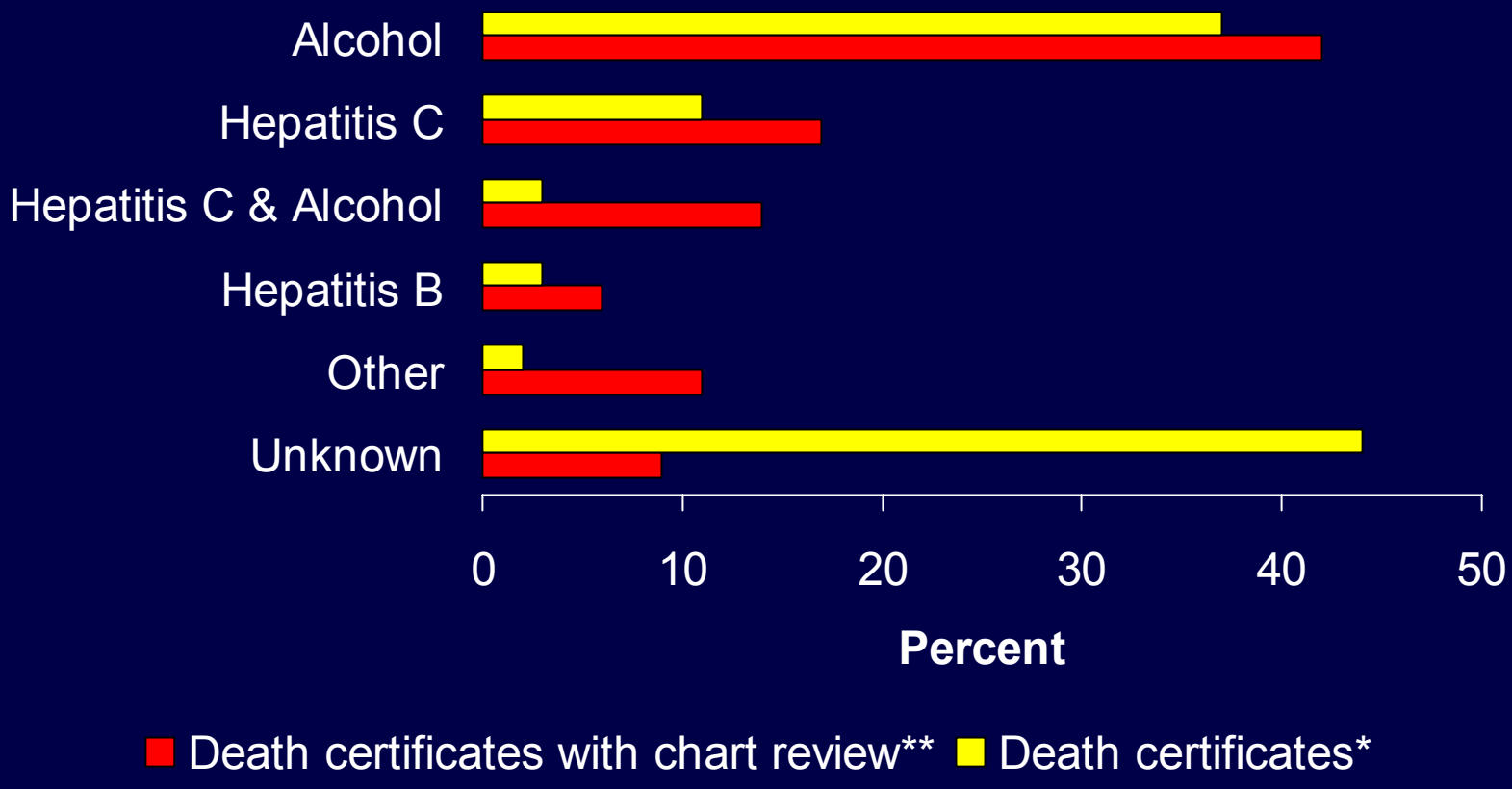
Distribution of etiologies of CLD deaths, with and without chart review



*1998 deaths in U.S.; **2000 deaths in Northern California Kaiser

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Chronic Liver Disease Mortality Conclusions

- Standard analyses of death certificates poor reflection of mortality trends. Using more sensitive definition -
  - 1998 deaths increased by 23%
  - Mortality declines of early 1990's not sustained after 1994
- True mortality burden probably considerably higher
  - ~ 30% increase in rate when combine sensitive definition with chart review
- Etiology-specific mortality information incomplete on death certificates. Chart review studies suggest -
  - Alcohol alone accounts for 40-50%
  - Hepatitis C +/- alcohol for 30%

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Prevalence of liver disease* among adults, by selected characteristics, National Health Interview Survey, 1999

Characteristic	N, thousands (%)	Rate/1000
Total	1,819 (1)	9.1
Age, years		
18-44	682 (37)	6.3
45-64	822 (45)	14.0
65-74	206 (11)	11.6
≥ 75	109 (6)	7.4
Sex		
Male	963 (53)	10.2
Female	836 (47)	8.0
Race		
White	1,393 (77)	8.5
Black	219 (12)	9.8
Other/multiple	166 (9)	13.5
Ethnicity		
Hispanic	195 (11)	9.5
Non-Hispanic	1,624 (89)	9.1

Response to question: “Have you been told in the last 12 months by a doctor that you have any kind of liver condition?” Includes cirrhosis, fatty liver, hepatitis, yellow jaundice, any other liver trouble.

CLD period prevalence
Other data sources

- NHANES III – prevalence of “explained” elevated ALT level – 2.4% (Clark et al)
- NHCLS – prevalence of CLD in primary care practices, from retrospective chart review – 3.7% (Navarro et al)

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Chronic Liver Disease Surveillance Study Case Ascertainment

- Adult cases of newly-diagnosed chronic liver disease in gastroenterology practices
  - All practices serving population base of ~1.5 million
- Determine eligibility using standard case definition based on chart review
  - Abnormal liver tests for > 6 months
  - Diagnostic imaging study or biopsy
  - Clinical event

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Chronic Liver Disease Surveillance Study Data Collection

Eligible patients

- Chart Review
  - Demographics
  - Treating physician diagnosis

Enrolled patients

- Interview
  - Risk factors
  - Lifetime alcohol consumption
- Chart review
- Serum specimen
- Liver biopsy slides

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Chronic Liver Disease Surveillance Study Analysis

Eligible patients

- Age and sex-specific incidence rates using relevant adult population denominators

Enrolled patients

- Specimens tested for markers of viral hepatitis
- Liver biopsy slides reviewed by study pathologists
- Diagnoses assigned by hepatologists using standard definitions
  - Heavy alcohol consumption
  - Etiologies
  - Cirrhosis

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Incidence of newly-diagnosed chronic liver disease, by age and sex; Referred patients, 1999-2001

Characteristic	Total N	Annual Rate/100,000
Overall	2609	67
Age, years		
< 35	265	20
35-54	1707	107.3
> 54	637	58.3
Sex		
Male	1601	89.3
Female	1008	50.7

Results are preliminary

Source: Bell et al, Hepatology 2001;34:468A

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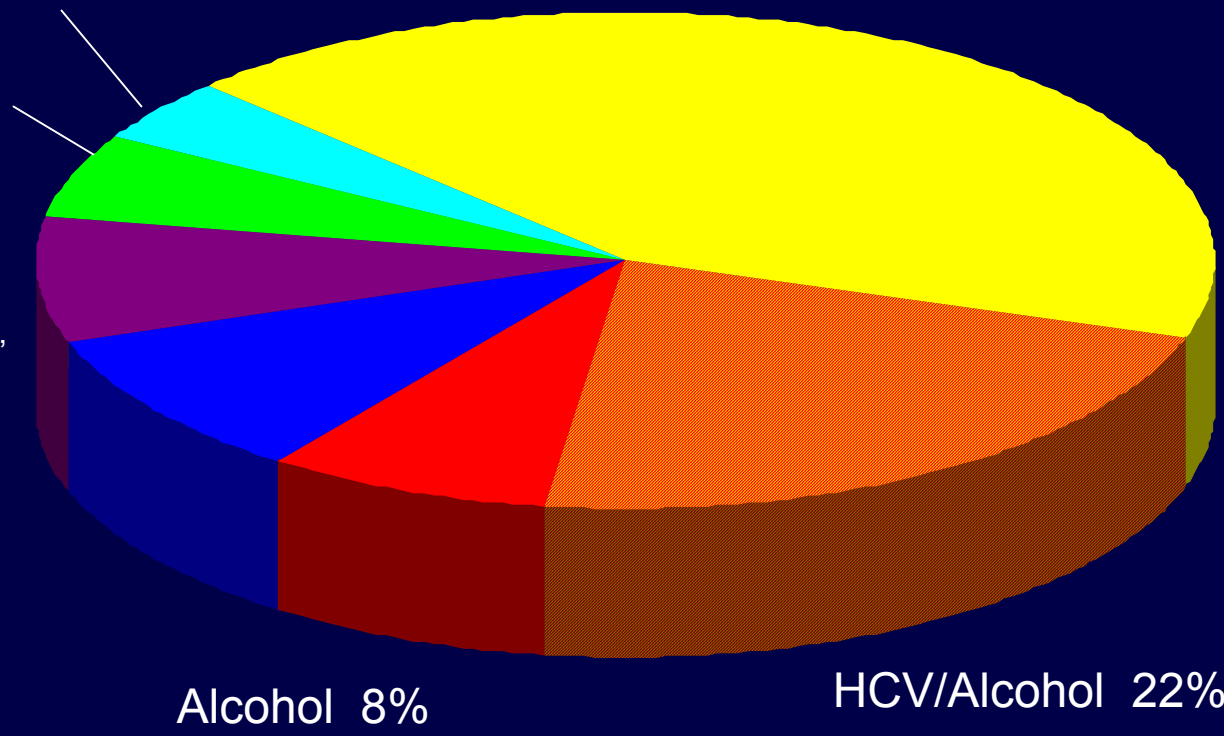
Etiology of newly-diagnosed chronic liver disease; Referred patients; 1999-2001; n=725



* Autoimmune hepatitis, Drug induced, Hemochromatosis, PBC, PSC, HCC, Cryptogenic, Granulomatous

Results are preliminary

Source: Bell et al, Hepatology 2001;34:468A

CDC

Prevalence of cirrhosis, by diagnosis; Referred patients; n=725

Diagnosis	Total n	Cirrhosis n (%)
Total	671*	132 (19.7)
Alcohol	55	29 (52.7)
Alcohol/Hepatitis C	148	34 (23.0)
Hepatitis C	283	39 (13.8)
NASH	61	7 (11.5)
NASH/Hepatitis C	18	2 (11.1)
Hepatitis B	23	3 (13.0)

* For 54 patients, cirrhosis status unknown

Results are preliminary

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Chronic Liver Disease Surveillance Study, Non-Referred Patients, Kaiser Permanente Alameda County, CA

- Patients ascertained from review of laboratory and clinical information
  - Does not require physician to diagnose
- Methods otherwise same
  - Case definition
  - Data collection
  - Diagnosis assignment

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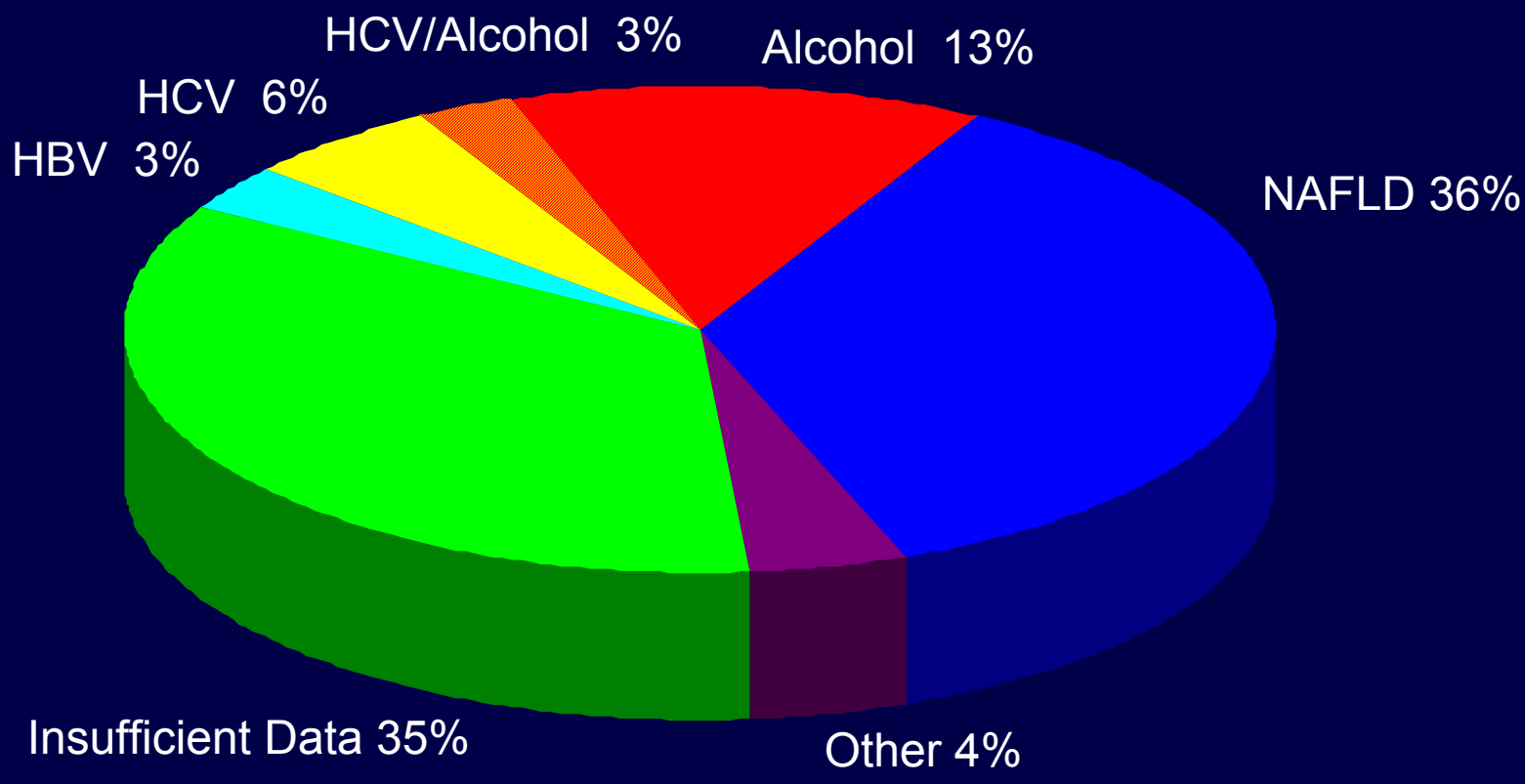
Etiology of Chronic Liver Disease, Non-Referred Patients, Kaiser Alameda County, CA, 1999-2001; n=721*



Autoimmune, Drug induced, Hemochromatosis, HCC, PBC, PSC, Cryptogenic, Granulomatous

*Annual rate ~85/100,000

Results are preliminary

Chronic liver disease in the United States
Conclusions from population-based surveillance

- In recent years, ~150,000 patients per year were newly-diagnosed with chronic liver disease in GI offices
  - ~ Two thirds had hepatitis C
  - ~20% presented with cirrhosis
- NAFLD predominant diagnosis among non-referred patients
  - Implications for disease burden unclear
- Some patients under-represented in studies of primary care and GI practices
  - HIV infected
  - Alcoholics

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Chronic HBV infection

(Approved 2002)

Clinical criteria

- None

Laboratory criteria

- Hepatitis B surface antigen (HBsAg) positive, total anti-HBc positive (if done) and IgM anti-HBc negative, or HBsAg positive two times at least 6 months apart.

Case classification

- Confirmed: Laboratory confirmed

HCV infection, chronic or resolved (Approved 2002)

Clinical criteria

- None

Laboratory criteria

- Anti-HCV positive, verified by an additional more specific assay (e.g. RIBA or PCR for HCV RNA), or
- Anti-HCV positive with signal to cut-off (SCO) ratio of ≥ 3.8

Case classification

- Confirmed: Laboratory confirmed
- Probable: Case with abnormal ALT values but the anti-HCV EIA result has not been verified by a more specific assay or SCO ratio is unknown.

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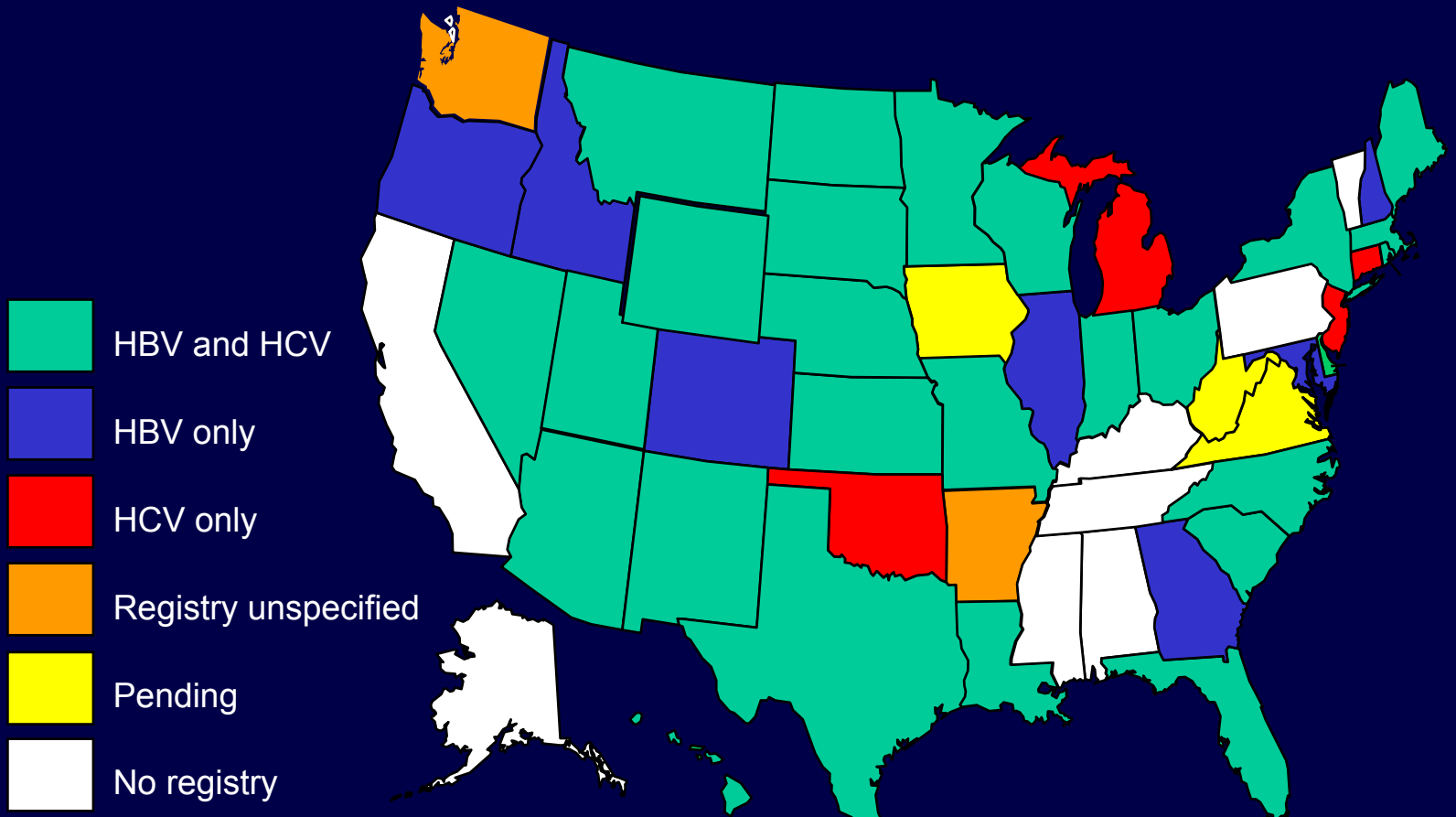
States reporting registries, 2002



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NNDSS
Chronic Hepatitis B and C

- Chronic Hepatitis B
  - 2002 partial year 4,897 “cases”
  - 2003 to date* 10,101 “cases”
- Chronic Hepatitis C
  - 2002 partial year 28,168 “cases”
  - 2003 to date* 59,796 “cases”

*as of November 21, 2003; 20 states reporting

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Population-based surveillance
Future plans

- Complete first phase of study
- Begin 5 year follow-up of original cohort
- Single site studies
  - Primary care practices using same method
  - Hepatitis C cross sectional prevalence survey
- Assemble population-based cohort of persons with viral hepatitis
  - Ascertainment through laboratory-based reports to health departments

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